

## **RETRACTABLE AWNING WITH LIGHT AND SOUND FEATURES**

### **BACKGROUND OF THE INVENTION**

#### **Field of the Invention**

The present invention relates generally to retractable awnings, and more specifically to a retractable awning having light sources and speakers for an audio system incorporated therein.

#### **5   Description of the Relevant Art**

Retractable awnings have been used for many years to provide shade or aesthetics adjacent to a window, door, patio, deck or the like on building structures. More recently, retractable awnings have been mounted on the sides of recreational vehicles, mobile homes, or the like to provide shade adjacent to the vehicle and define  
10   a patio like area when the vehicle is parked.

Retractable awnings have taken numerous forms, but generally include an awning canopy secured along an inner edge to a mounting rail on a support surface and along an outer edge to an outer rail. A support system extending between the mounting rail and the outer rail allows the awning to be extended or retracted in  
15   which case the awning sheet is unwrapped from or wrapped about a roll bar incorporated into the mounting rail or the outer rail.

As will be appreciated, when the awning is mounted on a recreational vehicle, motor home or the like, the area defined beneath the awning may be utilized like the patio or deck of a building structure where individuals congregate to enjoy the  
20   outdoors sheltered from the sun or rain. Further, since use of the area beneath an awning is not limited to daylight hours, it is sometimes useful to have a light source beneath the awning to facilitate use of the area in the evening hours.

Retractable awnings have been provided with features that accommodate various utilitarian functions. By way of example, light sources have been  
25   incorporated into longitudinally extending grooves formed in a roll bar in the outer

rail of an awning as shown for example in U.S. Patent No. 5,148,849, entitled  
“Lighted Retractable Awning” which is of common ownership with the present  
invention. Further, fans have been incorporated into retractable awnings. By way of  
example, such a system is illustrated in U.S. Patent No. 5,934,349, entitled  
5 “Retractable Awning with Cooling Fan” which is also of common ownership with the  
present invention.

Roll bars forming the outer rail for an awning typically include elongated  
grooves which have also been used as a removable support location for hanging  
potted plants or the like. As will be appreciated, owners of retractable awnings,  
10 particularly of the type used on recreational vehicles, have a desire to make the space  
beneath the awning more useful during daylight or evening hours.

It is to satisfy the increasing demands of retractable awning users that the  
present invention has been developed.

#### BRIEF SUMMARY OF THE INVENTION

The retractable awning of the present invention includes an awning sheet  
15 connected along an inner edge to a mounting rail secured to a support surface and  
along an outer edge to an outer rail which may include a roll bar about which the  
awning sheet can be wrapped. A support system interconnects the support surface  
with the outer rail so that the outer rail can be selectively moved between a retracted  
position adjacent to the support surface and an extended position displaced from the  
20 support surface.

The outer rail includes a pair of end caps at opposite ends thereof, defining  
contiguous extensions from the opposite ends of a main body of the outer rail. Each  
end cap includes a housing having a pair of openings along a lower surface with a  
light source and a speaker mounted within the housing in alignment with respective  
25 ones of the openings. Outlets for connecting the light source to an electrical power  
supply and for connecting the speaker to an audio system are provided such that when

the end caps are mounted on the main body portion of the outer rail, they are automatically connected to sources of electricity and sound, respectively.

Other aspects, features and details of the present invention can be more completely understood by reference to the following detailed description of a preferred embodiment, taken in conjunction with the drawings and from the appended  
5 claims.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an isometric view of a recreational vehicle incorporating an awning in accordance with the present invention.

Fig. 2 is a fragmentary isometric looking along line 2-2 of Fig. 1.

10 Fig. 3 is a fragmentary isometric looking along line 3-3 of Fig. 1.

Fig. 4 is an isometric of the outer rail of the awning of Fig. 1 with the end caps shown exploded from the main body of the outer rail.

Fig. 5 is an isometric looking upwardly at the left end cap as viewed in Fig. 4.

15 4. Fig. 5A is an isometric looking upwardly at the right end cap as viewed in Fig. 4.

Fig. 6 is an isometric looking downwardly at the rear of the left end cap as viewed in Fig. 4.

Fig. 6A is an isometric looking downwardly at the rear of the right end cap as viewed in Fig. 4.

20 Fig. 7 is a section taken along line 7-7 of Fig. 5.

Fig. 7A is a section taken along line 7A-7A of Fig. 7.

Fig. 8 is a section taken along line 8-8 of Fig. 7.

Fig. 9 is an exploded isometric of the left end cap as viewed in Fig. 4.

Fig. 10 is an isometric looking at the rear of the top half of the housing for the end cap used in the awning of the present invention.

Fig. 11 is an isometric looking at the rear of the lower housing component of  
5 the end cap used in the awning of the present invention.

#### DESCRIPTION OF THE PREFERRED EMBODIMENT

The awning 20 of the present invention is shown mounted on the side of a recreational vehicle 22 in Fig. 1 where it will be seen that the awning includes a mounting rail 24 secured horizontally to an upper portion of a side wall 26 of the recreational vehicle, an outer rail 28, and a flexible awning canopy 30 having an outer  
10 edge connected to the outer rail and an inner edge connected to the mounting rail. A support system 32 moves the awning between the extended position shown in Fig. 1 and a retracted position (not shown), wherein the outer rail is positioned adjacent to the mounting rail and the awning sheet is wrapped around a roll bar (not seen) that may be incorporated either in the outer rail or the mounting rail. The support system  
15 can take numerous conventional forms, but in the disclosed embodiment, it consists of a pair of scissor arms 34 (only one being seen) positioned immediately beneath the awning canopy 30 and extending between the mounting rail 24 and the outer rail 28. The awning further includes a motor or manual drive system (not seen) for extending the scissor arms and retracting the scissor arms to move the awning between extended  
20 and retracted positions in a conventional manner.

As can be seen in Figs. 1-4, the outer rail 28 for the awning has end caps 36 at opposite ends of a main body 38 with the main body having flat ends 40 to which the end caps are detachably connected. The end caps are mirror images of each other, and as will be described in detail hereafter, include a light source 42, a speaker 44 for  
25 an audio system, a support structure for the light source and speaker, and a two-piece housing having upper and lower housing components 46 and 48 respectively for enclosing the light and speaker components of the end cap. Also included in each end

cap is a modular connector 50 for connecting the light source to a battery or other source of electrical energy and a modular connector 52 for connecting the speaker to an audio system. As seen in Fig. 7, the modular connectors are complementary to corresponding connectors 51 and 53 respectively (Fig. 7) found in the ends of the outer rail 28 so that when the end caps are mounted on the main body 38 of the outer rail, the modular connectors are automatically or manually connected. The modular connectors 51 and 53 on the main body of the outer rail are in turn connected to the battery source and audio system respectively, carried by the recreational vehicle or building structure on which the awning is mounted.

As probably best seen in Fig. 9, each end cap 36 includes a mounting bracket 54, a mounting box 56 securable to the bracket, a pivotable mounting bracket 58 for supporting the light source 42, the light source itself, the speaker 44 that is mounted on the mounting box, and the upper and lower housing components 46 and 48 respectively that cooperate with the mounting bracket in concealing the remaining components of the end cap.

The mounting bracket 54 can be seen to include a rear plate portion 60 and an end plate portion 62 with the rear plate portion being configured to simulate approximately half of an ellipse and the end plate portion extending integrally and perpendicularly to the rear plate portion and being of a generally rectangular configuration. Both the rear plate and the end plate portions have a plurality of mounting apertures 64 through which fasteners (not seen) can connect the mounting bracket to other components of the end cap. A horizontally extending connector plate 66 is integrally formed on the rear plate having a connection aperture 68. The rear plate is also notched beneath the connector plate to provide access to the modular connectors 50 and 52 as will become more clear later.

The mounting box 56 is adapted to be mounted on the end plate 62 of the mounting bracket 54, and it is of generally U-shaped cross sectional configuration having a top wall 70, a bottom wall 72, an end wall 74, a pair of open sides 76, and an open end 78 opposite the end wall. Flanges 80 are provided along the open sides and

open end of the mounting box having openings therein so that fasteners (not seen) can secure the open end of the mounting box to the end plate 62 of the mounting bracket and one of the open sides to the rear plate portion 60 of the mounting bracket.

5           The bottom wall 72 of the mounting box has a circular aperture 82 therethrough, sized to receive a generally frustoconical body 84 of the speaker 44, with the speaker having a lower flange 86 protruding outwardly from its frustoconical body so that the body 84 can be inserted upwardly into the circular aperture 82 in the bottom wall 72 of the mounting box and the flange 86 secured to the underside of the bottom wall of the mounting box with fasteners (not seen).

10           The pivotal mounting bracket 58 is mounted on the closed end wall 74 of the mounting box 56 and includes a pair of spaced ears 88 having passages therethrough for receipt of a pivot pin 90. A base plate 92 of the pivot bracket has mounting slots 94 therethrough adapted to receive fasteners not seen to secure the pivot bracket to the closed end wall of the mounting box at a selected angular orientation.

15           The light source 42 includes a generally bulbous, truncated spherical body 96, having a protruding leg 98 from one surface, with a transverse passage through the leg. The leg is received on the pivot bracket 58 between the ears 88 and on the pivot pin 90 so that the light source can be selectively pivoted about the pivot pin.

20           When assembling the end cap 36, the pivot bracket 58 is first connected to the mounting box 56 and the light source 42 pivotally mounted on the pivot bracket to secure the light source to the mounting box. The speaker 44 is also then mounted on the mounting box by inserting it upwardly through the aperture 82 in the bottom wall 72 and securing the speaker flange 86 to the bottom wall as described previously. The mounting box is next secured to the end plate 62 of the mounting bracket 54 as  
25           described previously, so that the speaker and light source become connected to the mounting bracket. Since the end plate 62 of the mounting bracket is shorter in height than the rear plate 60, a space is defined above the rear plate and the mounting box to provide access to the modular connectors 50 and 52 for the light source and speaker which can be seen in Figs. 6 and 7.

The upper housing component 46 has an arcuate flange 100 connected to an arcuate top wall 102 with the flange extending vertically such that it can be connected to the top edge of the rear plate portion 60 of the mounting bracket 54 with fasteners (not seen). A compartment 104 at the rear of the upper housing component is defined  
5 by perpendicular walls, one of which includes openings 106 through which lead wires 108 pass for connecting the light source 42 and speaker 44 to the light source modular connector 50 and the speaker modular connector 52, respectively. The modular connectors will then be exposed for connection to their corresponding complementary connectors 51 and 53 on the main body 38 of the outer rail 28 as mentioned  
10 previously. The arcuate top wall 102 of the upper housing component flows continuously through an arc 110 into an arcuate front wall 112. The front wall has three vertically extending tubular members 114 integral with its inner surface for a purpose to be described hereafter.

The lower housing component 48 has an arcuate bottom wall 116  
15 corresponding generally with the arcuate top wall 102 of the upper component 46, with the bottom wall 116 flowing through an arc 118 into an arcuate front wall 120. The front wall of both the upper and lower housing component have the same curvature so that they become aligned when the housing components are mounted on the mounting bracket 54. The front wall 120 of the lower housing component has  
20 three vertical tubular members 122 of a smaller diameter than those of the top housing component, with the tubular members 122 in the bottom component extending upwardly a small distance above the top edge of the front wall 120 of the lower housing component. The tubular members in the lower housing component are adapted to be received in the corresponding tubular members 114 of the upper  
25 housing component to properly align the upper and lower housing components.

The bottom wall 116 of the lower housing component 48 has a generally cylindrical upstanding rib 124, the diameter of which is slightly smaller than the speaker flange 86 and has a height so as to be closely spaced from the face of the speaker flange when the speaker is mounted in the mounting box 56, and the  
30 mounting box is mounted on the mounting bracket 54. The bottom wall 116 of the

lower housing component 48 also has a generally frustoconical rib 126 that tapers inwardly and upwardly so as to define a circular opening 128 at approximately the same elevation as a circular opening 130 at the top of the cylindrical rib 124. The circular opening 128 is sized to receive in a close fit the truncated spherical body 96 of the light source 42. The lower housing component 48 further has a long mounting flange 132 extending upwardly from the rear edge of the bottom wall and a smaller corner flange 134 with the flanges having openings therethrough to receive fasteners so that the flanges can be secured to the rear plate 60 of the mounting bracket 54.

It will be appreciated that after the speaker 44 and light source 42 have been mounted on the mounting box 56 and the mounting box mounted on the mounting bracket 54, the upper and lower housing components 46 and 48 respectively can be aligned with each other and secured to the rear plate 60 of the mounting bracket to enclose the end cap 36. When the lower housing component 48 is connected to the mounting bracket, the truncated spherical light source body 96 is disposed in the open top 128 of the frustoconical rib 126. The light source is pivotally mounted on the pivot bracket 58 so that it can be properly positioned for receipt in the open top of the frustoconical rib, but once so positioned, it is seated so that it does not move. It will also be appreciated that the pivot bracket can be tilted relative to the closed end wall 74 of the mounting box due to the slotted nature of the mounting slots 94 in the pivot bracket. This permits proper alignment of the light source with the open top 128 of the frustoconical rib.

As is probably best seen in Figs. 6 and 6A, when the end caps 36 are fully assembled, the modular connectors 50 and 52 for the light source and speaker are properly positioned at the end of the end cap and in a position to mate with the complementary connectors 51 and 53 on the end of the main body 38 of the outer rail. When the end caps are abutted against the associated flat ends 40 of the main body, the connector plate 66 protrudes into the main body and is secured thereto with a fastener that is not shown to securely but reliably connect the end cap to the main body. Fasteners can also extend from the interior of the main body of the outer rail into apertures in the end plate 62 to further secure the end caps to the main body.

It should also be appreciated that the end caps 36 are configured to be aesthetically pleasing in a generally bullet shape at each end of the main body of the outer rail and are also therefore aerodynamically acceptable when the awning is mounted on a recreational vehicle or other mobile vehicle where aerodynamics are of some importance.

As will also be appreciated from the above, when the awning 20 is in use or even when it is retracted adjacent to the support surface or side wall 26 of the recreational vehicle, building structure or the like, spaced light sources are provided near the support surface as well as the spaced speakers so that the output from an audio system is available outside the vehicle and can be stereophonic by wiring the speakers to the left and right speaker outputs of a conventional audio system.

Although the present invention has been described with a certain degree of particularity, it is understood the disclosure has been made by way of example, and changes in detail or structure may be made without departing from the spirit of the invention as defined in the appended claims.